



VIRAL HEMORRHAGIC FEVER

What is viral hemorrhagic fever (VHF)?

Viral hemorrhagic fever (VHF) refers to a group of illnesses, caused by infection with certain viruses, in which multiple organ systems are generally affected, and in which there characteristically is damage to the vascular system. VHF is caused by viruses from four distinct families: arenaviruses, filoviruses, bunyaviruses, and flaviviruses. Each of these families share certain features: 1) their survival is dependent on an animal or insect host, called the natural reservoir; 2) the viruses are geographically restricted to the areas where their host species live; 3) humans are not the natural reservoir for any of these viruses; 4) humans are infected when they come into contact with infected hosts. However, with some of these viruses (for example, Ebola, Marburg, and Lassa), after a person is infected he/she can transmit the virus to others.

Naturally occurring human cases or outbreaks of VHF occur sporadically and irregularly. But there is now concern that some of the VHF viruses might be obtained by bioterrorists and introduced into the air (as an aerosol) in a particular location(s), potentially infecting large numbers of persons who could become severely ill and die. Of most concern here are filoviruses (for example, Ebola virus, Marburg virus) and arenaviruses (for example, Lassa virus, Machupo virus).

What are the symptoms?

Specific symptoms vary by the type of VHF, but initially often include marked fever, fatigue, dizziness, muscle aches, loss of strength, and exhaustion. Patients with severe cases of VHF often show signs of bleeding under the skin, in internal organs, or from body orifices like the mouth, eyes, or ears. However, although they may bleed from many sites around the body, patients rarely die because of blood loss. Severely ill patients may also show shock, nervous system malfunction, coma, delirium, and seizures. Some types of VHF are associated with renal (kidney) failure.

How do you get it?

Those VHF viruses carried in rodent reservoirs are transmitted when humans have contact with urine, fecal matter, saliva, or other body excretions from infected rodents. The viruses associated with arthropod vectors are spread most often when the vector mosquito or tick bites a human, or when a human crushes a tick. However, some of these vectors may spread virus to animals, including livestock. Humans then become infected when they care for or slaughter the animals.

For those VHF viruses that can be transmitted from an infected person to other persons, transmission generally occurs when an uninfected person has close contact with the infected person or his/her body fluids. Transmission through the air over longer distances appears to be rare but cannot be ruled out. Transmission can also occur indirectly, through contact with objects contaminated with infectious body fluids.

How soon do infected people get sick?

The period from the time of initial infection until the appearance of symptoms varies according to the specific VHF virus causing the infection, but generally ranges from 2-21 days.

How dangerous is VHF? Is there a treatment?

While some types of VHF viruses generally cause relatively mild illnesses, many of these viruses cause severe, life-threatening disease. For one subtype of Ebola virus, the fatality rate can be as high as 90%.

Careful supportive care is important for all persons with VHF, regardless of which of the VHF viruses caused the disease. Ribavirin, an anti-viral drug, can be used to treat arenavirus or bunyavirus infections.

Ready in 3 is an emergency-preparedness program for Missouri. The Missouri Department of Health and Senior Services sponsors the program. **Ready in 3** aims to help residents and communities prepare for many types of emergencies from tornadoes to terrorism. For more information, visit www.dhss.mo.gov.

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Can a person who is exposed to a VHF virus be treated so that they will not become sick?

There are no specific treatments recommended for use in persons exposed to a VHF virus in order to decrease the chances they will become ill. If an individual is known to have been exposed to one of these viruses, he/she should be closely monitored, and should immediately receive appropriate evaluation and treatment if symptoms develop.

Is there a vaccine for VHF?

With very few exceptions, no vaccines have been developed which can protect against infection with VHF viruses.

What should I do if cases of VHF start to occur in my community?

Local and state public health officials will provide you with the information you will need.

- Sources: 1. CDC. *Viral Hemorrhagic Fevers*. November 26, 2003.
2. Working Group on Civilian Biodefense. Hemorrhagic fever viruses as biological weapons. *JAMA* 2002;287:2391-2405.